

the bone will necessarily fall down through its own weight, without the application of any force, and without the least resistance being opposed by the ligaments of the joint.

6. Anomalous Menstruation.—M. BOURGEOIS has met with a curious example of this. A young lady of 15 or 16 years of age, commenced some time since to menstruate from the extremities of each of her ten fingers. At the second menstrual epoch, the hemorrhage was renewed from the same place, and at the period when M. B. communicated the fact to the Medical Society of Paris, the menses had not appeared in the natural manner.—*Rev. Med. Aug. 1836.*

MEDICINE.

PATHOLOGICAL AND THERAPEUTICAL.

7. Observations on the sudden death of Children from enlargement of the Thymus Gland. By W. F. MONTGOMERY, M. D.—The fact that children, apparently in good health, sometimes die suddenly—that is, in the space of a minute or so—is too well known to render any thing more than the mere allusion to it necessary; but the cause, or at least one of the occasional causes, is not so well understood. I have now seen several instances of a very singular mode of death in children, and there are some gentlemen in this city who have witnessed the cases with me, and seen the results. I allude here to those cases in which young children are suddenly cut off by an undue enlargement of the thymus gland.

A minute account of the form, structure, and relations of the thymus gland, would be here misplaced, and does not appear necessary: but as there may be some to whom the matter may not be so familiar, I trust I shall be excused for touching briefly on this point. The thymus gland is a peculiar body, discoverable in the fetus about the third month of intra-uterine life, and in the fourth month presenting itself as a distinct organ occupying the upper and anterior part of the thorax. About the time of birth it possesses considerable size, and is lodged behind the superior part of the sternum, lying over the lungs and heart. It covers a considerable portion of the lungs and pericardium, passes through the superior aperture of the thorax, and extends upwards as far as the thyroid gland; part of it is therefore confined by a bony case, and part of it free; being covered in the neck merely by the integuments and a thin layer of muscular substance. Its tissue is soft, loose, and pulpy, and contains a vast number of small cells opening into a large reservoir. This reservoir is as large, in proportion to the gland, as one of the ventricles is to the heart, and is very well represented in one of the plates to Sir A. Cooper's work.* The cells of the organ are filled with whitish cream-coloured secretion, which has some of the properties of chyle. The parenchyma of the gland is very soft, spongy, and highly distensible. Its supply of blood is also very remarkable. This is furnished by four long arteries, of which the two superior are generally branches of the thyroid arteries; the two inferior ones are derived from the internal mammary. Its veins, (and this is a point deserving of attention) are also divided into two sets, the upper opening into the thyroid veins, the lower emptying themselves into the left vena innominata.

The thymus gland is then a soft, spongy, and highly distensible organ, forming in the newly born infant, a mass of considerable size, situated in the upper part of the thorax, and extending up the neck as far as the thyroid gland, partly free and partly confined, lying over the pericardium, lungs, and the roots of the great vessels, abundantly supplied with blood, and capable from its position of exercising, under certain circumstances, a considerable degree of pressure on the trachea and left vena innominata. Its ordinary weight at birth is about half a ounce, or 240 grains.

If we examine the superior aperture of the thorax, and observe that in this situation we have the trachea, oesophagus, the great arteries of the head and upper extremities, the vena innominata, and the phrenic and pneumogastric, recurrent, and sympathetic nerves; if we reflect also that in this situation we have an organ of considerable dimensions, and capable of great distension, we can easily understand

* On the Anatomy of the Thymus Gland, Plate iv. fig. 6.

that any deviation in point of size will produce important results with respect to the condition of the surrounding organs. In the natural condition, this gland does not produce any inconvenience; but when it becomes enlarged from temporary and accidental causes, or more permanently from disease, so as to exercise a sudden or inconvenient pressure on the surrounding organs, we should expect corresponding changes in the condition of these parts. Hence it is, that enlargement of the thymus gland is frequently connected with sudden and remarkable alterations in the state of the great vessels, heart, lungs, and brain.

Having mentioned these facts, I shall proceed to detail a few cases of this remarkable affection. The form in which I have observed it myself, and in which it has occurred to others, is this:—Children in apparently good health, and who have even attracted attention by their florid complexion and high condition, are observed, when thwarted, frightened, awaking from sleep, or swallowing, or when under the influence of any mental emotion, to become all at once violently agitated; the hands are thrown up, the features become fixed, the eyes staring, and the breathing suspended; in a short time the fits cease, and respiration and vital power are restored, or the infant drops its head on the nurse's shoulder, and dies. The first thing which occurs when the paroxysm ceases, is a slight fine whistling inspiration, as if the respiratory act was for the first time established.

The first time my attention was directed to this subject was on receiving about seven years ago, from Dr. Neason Adams, of this city, an enlarged thymus, of which he has given me the following account:—The child from whom it was removed began to be affected, when eight months old, with what was considered spasm of the glottis, and, under the Doctor's judicious treatment, got so much better that it was not thought necessary to continue the administration of the remedies employed; the attacks, however, returned, and a repetition of the former medicines was about to be sent for; but one morning, when at the breast, and apparently as well as possible, its head dropped back on the mother's arm: she immediately ran towards the window, but, before she could get there, every sign of life had ceased, without fit or struggle of any kind.

Another case communicated to me by the same gentleman is most painfully interesting. The child was brought to the Doctor, that he might see the great amendment that had taken place in its state of health, and to have the guns examined: which latter examination he declined, as the attempt had, on two former occasions, brought on a paroxysm. The mother not being satisfied, and anxious to have the guns examined, undertook to separate the jaws of the child; doing so brought on the attack, and in an instant the child was a corpse in her arms.

The next case was one which occurred in my own practice. It was the child of a lady who had been herself very delicate in childhood, and was of a rather feeble habit in after life. She had also been subject to some affection in the throat, the nature of which I could not ascertain. The child, which was a boy, was born in August; about three weeks after his birth he appeared agitated and affected in his breathing when startled or awaking from sleep. This was at first regarded as accidental, but as the fits continued to recur at intervals, the parents took the alarm, and sent for me to see him. I saw that there was something wrong, and endeavoured to find out the cause, but could not discover any thing in the chest or elsewhere, to account for the occasional affection of the respiration, and the child was in other respects handsome, healthy, and thriving. The first severe attack it had was on Dec. 10, at night; the child awoke suddenly, started, screamed, and threw up its arms. When lifted up, it started with an expression of wildness and distress, its features were fixed, and the respiration entirely suspended. On throwing up the window sash, and letting in a stream of fresh air, it began to breathe, but with considerable difficulty, and the agitation continued for several hours. On seeing the child, I thought that the sudden suspension of respiration might be connected with an affection of the brain, and under this impression prescribed some calomel powders, and a blister to the nape of the neck, which produced relief. The next attack which it had was Dec. 13, in giving it some medicine. The nurse threw it on its back, held its hands, and tossed the medicine down its throat. A fit similar to the former, and still more alarming, was the almost immediate consequence. After this it was put under a course of medicine by Dr. Harty and myself, and appeared to be going on very well. The last attack was on the 27th of January, at which time the child was five months

old, and apparently in the most perfect health. The child's grandfather was about to proceed to a levee at the Castle; the infant appeared to be highly delighted with his dress, which was very splendid, and was brought by the nurse to see him get into his carriage. It was brought back to the drawing-room, delighted and jumping in the nurse's arms; when suddenly it stared wildly, made a violent convulsive effort, dropt its head on the nurse's bosom, and expired. Medical assistance was instantly called in, but the vital spark was entirely extinct, and every attempt at resuscitation was fruitless. On dissection, at which Dr. Hartly, and Dr. Marsh, were present, the thymus gland was found greatly enlarged, and, from the quantity of blood which it contained, of a deep crimson colour. The ordinary size of the thymus gland in infants is known to most practitioners, and will be found very well represented in Sir A. Cooper's plates. In the natural state it is about two inches in length, an inch and a half in breadth, and a quarter of an inch in thickness. In this child it was three inches and a quarter long, nearly three inches in breadth, and fully three-fourths of an inch in thickness. I did not weigh it, but I am sure it weighed at least two ounces; and when we recollect that the ordinary weight is about half an ounce, the enlargement in this instance will appear very considerable.

The next instance in which I had an opportunity of observing this affection, was in the child of a physician in this city. This case was one of extreme interest and concern to the family, for the child's eldest brother had died of an attack of the same disease; and is still more interesting in a practical point of view, as the detection of the disease led to the adoption of a successful plan of treatment. The following circumstances are given from a letter which I received from the child's father:-

"The eldest of my children (William,) who suffered from the affection you note refers to, was a remarkably fine, healthy, placid looking child, up to five months old. About that age (in December, 1830) he was seized, while asleep, with what appeared to be convulsions. His face was swollen; his eyes fixed; his breath spasmodically retained; he gaped and struggled for some time, and when he at length recovered his breath he uttered several sharp cries, as if in much distress. The attacks soon became frequent, and generally occurred during sleep, when fretted, agitated, or frightened by any sudden noise or motion, or whenever his breath was from any cause obstructed, but sometimes also when smiling and playful. The fits used sometimes to last so long, that his face became nearly black from the obstruction of his breath; and one, which lasted only a little longer than the others, suddenly deprived him of life. He had been a moment before cheerful, and apparently free from all illness. He died at the age of eight months, having been ill three."

The second child was attacked for the first time in the eleventh month of his age (March, 1831,) having been previously remarkably healthy. In his ease the upper part of his sternum projected in a remarkable manner, as if forced outwards by the pressure of the enlarged thymus gland, which could be felt. The paroxysms were well marked, but not so severe as they had been in his brother, nor occurring at such short intervals. The treatment adopted in this case was the following:-A few leeches were applied over the situation of the enlarged gland, in order to diminish its vascularity and hypertrophy, and afterwards a small blister, which was kept open by proper dressings. The ointment of hydriodate of potash was rubbed in around the part, and medicines were administered to regulate the state of the bowels; a good but not stimulating diet, country air, and sea-bathing, were advised. Under this plan of treatment the hypertrophy of the gland was soon reduced, and the paroxysms had completely ceased at the end of a month. He is now more than three years old, remarkably healthy and stout, and the projection of the sternum has entirely disappeared. I was happy to have the assistance of Dr. William Stokes in this case.

With respect to the conditions of other organs as connected with this affection, the following circumstances have been observed on dissection: A very curious state of the heart has been detected; this organ being found quite empty, without a particle of blood or coagulum, contracted on its dimensions, and as it were pinched on itself. In the head a quantity of serous fluid has been frequently discovered, and hence such cases have been pronounced cases of hydrocephalus, although none of the symptoms of the latter affection were observable during life.

Now if we bear in mind that the position of the gland is such that when enlarged it must greatly obstruct the return of blood from the head, and reflect on the effect which this must have on the capillary origins of the veins, we can easily understand why serous effusion should be as natural a consequence as ascites from enlargement of the liver, or anasarca of the extremities from a pressure of a gravid uterus, or an enlarged ovary. Enlargement of the mesenteric glands has been very frequently found in connexion with this disease.

But a question of more importance is, how does the enlargement of the gland produce the fatal result? I think the matter admits of a satisfactory explanation. Enlargement of the thymus gland may occur in three different ways. In the first place it may be the effect of simple hypertrophy, connected with general plethora, occasioned principally by over feeding. Sanguification goes on actively, and a large quantity of blood is sent to all the glandular organs, and among the rest to the thymus, by which its substance is hypertrophied, and its vessels distended with blood, so that its cells become loaded with the fluid peculiar to them; and in this way the volume of the gland may be considerably increased. In the second place the enlargement may be connected chiefly with the disproportion between the size of the gland and the capacity of the superior aperture of the thorax.* Lastly, the gland may be enlarged as the result of actual disease.† The same form of scrofula which is observed in other glandular organs, may also attack the thymus; and it is well known the disease in question is most apt to occur in children who have exhibited scrofulous affections of other parts.

We now come to examine another part of the subject, namely, the mode in which this enlargement may thus suddenly impede the functions of respiration, circulation, and nervous energy, and thereby destroy life, which appears to me to be thus: Supposing any cause to occur capable of producing agitation or strong mental excitement in the child, and that the gland has been previously enlarged, and capable of great distension, a number of circumstances will occur which combine in rendering that distension still greater, and increasing the size of the gland in such a manner as to affect materially the condition of the surrounding parts. Any cause producing agitation on the part of the child, excites the heart's action; the enlarged gland becomes distended and increased in size, presses on the vena innominata, and prevents the return of blood from the head. The same pressure prevents the venous blood of the thymus itself from getting into the innominata, and thus becomes a fresh source of distension. The combined result of this is great and dangerous pressure exercised on the great vessels, preventing the return of blood from the head, and thereby suddenly producing cerebral congestion; on the trachea, by which respiration is impeded; and on the important nerves in that situation, especially the sympathetic, the par vagum, and its recurrent branches, any interference with which has been proved by the experiments of Dr. Alcock, of this city, and others, most powerfully to influence the function of respiration; and Le Gallois found that in young animals the division of the recurrents was sufficient to cause almost immediate death. This latter agency, especially when exercising its influence in conjunction with the others just mentioned, it seems to me reasonable to believe must contribute to the remarkably rapid extinction of the powers of life. The affection, at least, must be different from either ordinary apoplexy or suffocation, for it happens in an

* While writing these observations, I was requested to examine the body of an infant, aged five months, son of an esteemed medical friend. The child was taken out of bed at seven o'clock in the morning, was fed, and again laid in its cradle, appearing to be perfectly well; but in a few minutes the attendant thought there was something unusual in the sound of its breathing, and on approaching it, it appeared to be dying, which was the fact; in a few minutes it expired without a struggle. On examination, no remarkable morbid lesion could be discovered which would satisfactorily account for its death. There was serous effusion on the surface of the brain, one hemisphere of which was more transparent and gelatinous than usual: the upper aperture of the thorax appeared to me of unusually small dimensions; the thymus was not enlarged, but it was very hard from the deposition of a firm tubercular matter in its substance, and the part of the trachea over which it lay was distinctly flattened; there was also very extensive mesenteric glandular disease, and the heart was empty and wrinkled. I am strongly impressed with the belief that in this case diminished space in the aperture of the thorax, conjoined with the indurated state of the thymus, led to the fatal event, in a manner analogous to that which would be the result of hypertrophy of the gland.

† Several instances of such diseases are detailed in Craveilhier, Portal, Lieutaud, and others.

instant: while you are looking at the infant, it droops its head and dies, and generally without effort or struggle of any kind. It may be also that in this case the ascending lava does not supply a sufficient quantity of stimulus to the heart, while at the same time the compression of the brain, by interrupting the nervous influence, tends to superinduce paralysis of that organ. Kopp attributes the sudden death in these cases to the pressure on the air tubes.

With respect to the treatment, it is either immediate or preventive. When a paroxysm comes on, the child should be placed in the upright position, with the head slightly inclined forwards, and in this way exposed to a full draught of fresh, cool air, while cold water is at the same time sprinkled over the face. Every means should be taken to remove as far as we can the compression from the veins and nerves, as well as to relieve the oppressed action of the respiratory system. When children are subject to fits of this kind, food should never be given by laying them on their back, and tossing the food down their throat, for this is very apt to bring on a paroxysm; and they should never be rudely awaked, or roused suddenly from sleep.

With regard to the treatment to prevent the return of the disease, we should adopt such a plan as would have the double effect of removing hypertrophy and local congestion, and improving the tone of the general system. Our curative measures must be directed, in part, locally to the situation of the enlarged gland, the reduction of which we should aim at by the application of leeches, blisters kept running, or frequently repeated, and disentients, such as ointments containing iodine; while we give internally purgatives, of which those that contain mercury, especially calomel, have been found most serviceable. In some cases antispasmodics and sedatives will do good, such as musk, camphor, assafoetida: preparations of zinc, especially the cynuret, have been extolled by some, and the cherry-laurel water, in combination with depletion, has been used with advantage. Along with such measures we should, if possible, adopt removal into the fresh air of the country, sea-bathing, and a careful regulated system of diet, which should be good, but of a kind not likely to stimulate. In weakly debilitated children, minute quantities of sulphate of quinine, continued for some time, are productive of great benefit.

In October, 1831, I saw, in consultation with the Surgeon-General, the infant child of Mrs. L., aged seven weeks, who had had three or four paroxysms of this affection: one of them very severe, lasting so long that the nurses thought the child must have expired before it could recover its breath; and for several hours it appeared in great distress. The child was in every respect the very picture of perfect health, and all the functions proceeding with the greatest regularity; but it appeared to me that the situation of the thymus gland was fuller than it ought to be, and on this view I acted. I had a leech applied near the part, which I directed should be diligently rubbed with a disentient and slightly irritating liniment twice a day, and administered, internally, calomel combined with jalap. This plan of proceeding being approved of by the Surgeon-General, was continued, and the child had no return of the attack.

It should be mentioned, that in most cases where benefit is derived from the treatment adopted, the recovery is very rapid, being not unfrequently complete within a few weeks.

In cases of this kind much blame is attributable to the system of excessive repletion adopted or permitted by mothers, whose over anxiety for the child's welfare leads them to indulge it in the use of improper aliment. I was called some time ago to a case of this kind, and found that the mother was in the habit of giving the child wine, punch, and bottled porter. On asking why she did so, she said it was to keep off the fits, for if the child did not get such things when placed before it, it became irritated, and a fit was generally the consequence. How easy would it have been to keep such things out of sight altogether! Very often after a paroxysm the child will remain many hours apparently in a state of great distress, starting, screaming, and clenching the hands, or twisting the thumbs into the palm, refusing to suck, or doing so ravenously, and moving the head as if in pain. Under such circumstances I have found nothing so soon or so effectually give relief as a small blister applied to the nape of the neck, a purgative of calomel, followed, perhaps, by an injection, and immersion to the hips in warm water.

Sometimes I have thought it necessary to premise the application of one or two leeches to the head.

About twenty years ago, Allan Burns, who foresaw that the occasional enlargement of the thymus gland might be a cause of serious disease, proposed to dissect it out. This would be certainly a most decisive operation in the way of cure, for after its performance the infant would not be likely to be troubled with this or any other complaint. I may observe here that this disease has been noticed by some authors, though it has not received the attention it deserves. Kopp, in the year 1830, described it under the name of asthma thymicum, and were it not likely to extend the limits of this paper unnecessarily, I would cite some of his cases to show that it is the same disease.* In one of them he observes that the mother of the child was of a strumous habit. It has been already observed that this disease is most frequently met with in scrofulous children, and in the children of scrofulous parents, although perhaps not exhibiting symptoms of that disease. There appears in some instances to be a family predisposition to this affection, so that several of the children take it in succession. It is scarcely necessary to observe, that all diseases affecting the function of respiration are likely to lead to this: the same may be said of the irritation of dentition, during which the condition of the child should be closely watched. Enlargement of the mesenteric glands is by some supposed to be a predisposing cause,† but I believe we only know that the two affections are very often found coexisting; and I may remark here, that it is much more seen in boys than in girls; in, at least, the proportion of seven or eight to one. The disease is not entirely confined to the period of infancy, for in Sir A. Cooper's work‡ a case is given in which the patient was 19 years of age. It has also been observed by Meckel and various modern authors. Sandifort, in his Pathology describes an enlargement of the thyroid gland in very old persons, but does not state what the symptoms were during life.

Lieutaud§ mentions the case of a man of 35 years of age, who had long suffered from pain in the chest, cough, violent headache, and want of sleep. The lungs and thymus were found scirrrous; and it is mentioned that "the heart was empty, and remarkably contracted on itself."

A second case,|| recorded by the same author, occurred in a young man of 20 years of age, who, after inflammation within the chest, remained affected with dyspnoea, and difficulty of lying on the left side; the body became oedematous, cough very troublesome, and the respiration so much impeded as to threaten suffocation. Empyema occurred, and the patient died. On examination the thymus was found of enormous volume, and scirrrous; and the lungs were equally diseased.

In the close of the year 1831, I attended a post-mortem examination with Dr. Harty, the subject of which had died of an affection almost precisely similar to that last detailed. He was a young man of 28 years of age: the tumour occupied the situation of the thymus, and was of immense size.

Since Kopp's treatise on the *Asthma Thymicum*, some cases have been published by Hirsch, of Königsberg, and others, all agreeing in the general characters already described. There is also a paper by Mr. Hood, of Kilmaineock, in the third volume of the Edinburgh Journal of Medical science, p. 39 (this latter paper preceded Kopp's, having been written in 1826,) detailing some highly interesting cases of this affection, with very judicious remarks thereon.—*Dublin Journal of Medical Science*, July, 1836.

8. *On Thymic Asthma*, compiled chiefly from the papers of Drs. Kopp and Hirsch, of Königsberg.—The Germans describe under the name thymic asthma, or Kopp's asthma, an affection peculiar to childhood, characterized by fits of suffocation, during which respiration appears suspended, and which return periodi-

* See an account of the researches of Kopp and Hirsch, in a subsequent page, present number.—Ed.]

† Mr. Burns seems to take quite an opposite view of the relation between the disease in the mesenteric glands and the enlargement of the thymus, which latter he appears to regard as the cause of the former. "By pressing on the subclavian vein it obstructs the passage of the chyle, and may thus excite disease in the mesenteric glands."—*Principles of Midwifery*, page 728, seventh edition.

: Jam clt. p. 44.

§ Hist. Anat. Med. t. II. p. 14, Obs. 448.

|| Op. cit. p. 118, Obs. 851.